

leukotoxic serum is not specific, inasmuch as it can be obtained artificially by injections of organs other than those which are concerned in the formation of blood cells. The leukotoxin, like the hæmolyins, is destroyed by heating at 55° C. for one-half hour.

Soluble Toxins of the Typhoid Bacillus.—LAGRIFFOUL and WAHBY (*Central. f. Bakt. u. Parasitkunde.*, Original, 1904, Bd. xxxv. p. 593) have succeeded in obtaining a substance in filtered cultures of the typhoid bacillus, which shows mild toxic properties for animals when injected intravenously or intraperitoneally. This toxic product varies in amount according to the conditions under which the organisms are grown. It is only present in any amount in young cultures, and if the growth is prolonged the toxin disappears. These facts are offered as an explanation for the failure of other observers to obtain a similar toxin in filtered cultures. The toxic substance is precipitated by alcohol and destroyed at temperatures of 52° to 58° C. The bodies of the typhoid bacilli from these cultures were killed by thymol and subsequently washed in salt solution. After suspension in salt solution these emulsions were injected into animals in doses corresponding to the amount of filtrate used. It was found that the bodies of the dead bacilli were less toxic than the filtered cultures. Further studies went to show that the toxicity of the filtrate was due to an elaboration of toxin by the living organism and did not result from the liberation of an intracellular toxin from the bodies of dead bacilli which might be present in the cultures. The authors conclude that living typhoid bacilli are capable of producing at least small quantities of a soluble toxin when grown in artificial culture media.

The Results of Obliteration of the Pyramids of the Kidneys in Rabbits.—TOLLENS (*Virch. Arch.*, 1904, Bd. clxxvii. p. 477) succeeded in closing the outlet from single medullary pyramids in the kidneys of rabbits and made observations on the changes which took place after intervals of four, eight and one-half, and twelve weeks. After four weeks the tubules of the medulla and cortex which had been drained by the occluded papilla showed a general dilatation, while a new formation of connective tissue could be observed in the cortex. After eight and one-half weeks the lesions had progressed in two directions. Some of the closed tubules had reopened and returned to their normal size. Elsewhere there had been marked increase in connective tissue, with compression of certain groups of tubules. Finally, a few canals, principally in the cortex, showed extreme distension. After twelve weeks the areas changed to small, contracted, well circumscribed scar-like masses, which had much the appearance of the contracted kidney. Microscopic examination showed that the areas were made up of dense connective tissue, with here and there a few remnants of tubular epithelium. These changes are analogous to the alterations produced in other organs after the closure of their excretory ducts.

The Pathological Effects of Periodic Losses of Blood.—The regular and periodic abstraction of blood from horses which have been used for the purpose of producing antitoxins leads to certain cases to serious derangement and death. A preliminary survey of these observations suggested to Theobald Smith (*Journal of Medical Research*, 1904, vol.

xii., p. 385) that the phenomenon which controlled the pathology of the condition was hæmolysis due to a weakening of the red cells. To test this hypothesis the resistance of the red cells of normal horses and of horses which had been repeatedly bled was determined toward various percentages of salt solution. With the red blood corpuscles of the normal horse hæmolysis begins when 0.60 per cent. salt solution is used and is complete with 0.42 per cent. solutions. These figures represent the maximum and minimum resistance of the blood cells. The resistance of the red corpuscles of most of the horses which had been repeatedly bled was so changed as to correspond to a rise in osmotic tension of 0.04 to 0.09 per cent. salt solution. Whereas, in the normal horse the greatest number of corpuscles are destroyed with solutions of 0.48 to 0.50 per cent., in the horses which have been bled, the most pronounced destruction may take place with 0.56 to 0.58 per cent. solutions. There is no evidence at hand to show that the injections of diphtheria toxin play any appreciable part in this change. Further experiments showed that the osmotic tension of the serum does not adapt itself to the change in the corpuscles.

Investigation upon the Anopheles in Hibernation.—SUZUKI (*Sei-I-Kwai Medical Journal*, 1904, xxiii., p. 81) finds that the anopheles mosquito may hibernate during the winter, and indeed is able to exist at a temperature of 7° C. Though the vital functions of these mosquitoes are much reduced, still the insects are capable of slow motion, and may even fly when disturbed. Between January 20th and April 1st the author was able to collect 186 mosquitoes, all of them females. During hibernation the insects do not retain that peculiar position which distinguishes them in summer, but rest like culex, with the axis of the body parallel to the wall. Most of the anopheles possessed fully-developed ovaries, and in a few instances ripe eggs were observed. The appetite of the insects is so slight that, as a rule, they are not likely to feed upon blood, though under favorable circumstances they may do so. In summer the digestion of the blood is completed in two to four days, whereas in winter the process is much slower and may take two weeks. On March 8th the author allowed himself to be bitten by several hibernating anopheles which had been kept in feeding cages. On March 24th symptoms of a quotidian malaria developed, while on April 1st a microscopic examination of his blood revealed great numbers of parasites. Without further investigations the author is not prepared to draw definite conclusions as to the origin of winter and spring malaria, but he inclines to the belief that the infection may be brought about by the bites of hibernating anopheles mosquitoes.

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